Space Weather Forecast

Issued on Thursday, 06 October 2022 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Potential CME arrival late day 1 or early day 2 (6th or 7th), with a chance of G1 Minor - G2 Moderate storms. Chance of isolated M-flares with a slight chance X-flare.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the last 24 hours. A large sunspot in the northern disc has remained relatively stable, despite being a long and magnetically complex region. This still has the potential for notable flares. There are a number of other regions on the Earth-facing disc, however these are all smaller and simpler, with perhaps the exception being a region to the north of the large complex sunspot that has also been showing some signs of growth. No Earth-directed CMEs (coronal mass ejections) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind speeds have been slightly elevated to elevated, between 450-530 km/s. Total magnetic field strength was mainly weak, but spiked at moderate levels for a time likely due to the peripheral influence of a weak CME. The north-south component was also weak to moderate varying between the two directions, but was generally more southward directed. Geomagnetic activity was Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been at background levels, with no solar proton storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, with occasional Moderate activity and a slight chance of High activity.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on the 4th has the potential to arrive at Earth late day 1 or early day 2 (6-7th), although confidence is Low. This may lead to slightly elevated to elevated winds persisting through day 2 (7th). Otherwise current fast winds are expected to gradually fade, before the next coronal hole source fast wind enhancement either later day 3 or day 4 (8th or 9th). Geomagnetic activity is forecast to be Quiet to Active at first, but with a chance of increasing to G1/Minor to G2/Moderate storm from any CME arrival. Activity then easing to Quiet to Unsettled for a time by day 3 (8th), but with a chance of Active intervals and a slight chance of G1/Minor Storms from any faster solar winds later in the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to be near or at background but with a chance of rising at times due to any further flaring from the notable sunspots. This giving a slight chance of exceeding minor proton storm threshold.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	40	10	20
Strong	G3	No	2	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	40	40
Very Active	R3 to R5 X	No	20	20	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.